AMENDMENTS TO THE CLAIMS

LISTING OF CLAIMS:

1. (Currently amended) A method comprising:

a) obtaining a plurality of coded probes, each coded probe comprising a probe molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two or more identifiably different nano-barcodes that create different signatures;

b) contacting one or more target molecules with the coded probes;

c) ~~arranging~~ aligning the coded probes that bind to the one or more target molecules on a surface by microfluidic molecular combing;

d) identifying the organized coded probes; and

e) detecting the one or more target molecules based on the bound coded probes.

2. (Original) The method of claim 1, wherein each coded probe comprises an oligonucleotide.

3. (Original) The method of claim 2, wherein the target molecule is a nucleic acid.

4. (Original) The method of claim 3, wherein a library of coded probes comprising all possible sequences for a particular length of oligonucleotide is contacted with the target molecule.

5. (Original) The method of claim 1, wherein the nano-barcode is selected from the group consisting of carbon nanotubes, fullerenes, submicrometer metallic barcodes, nanoparticles and quantum dots.

6. (Original) The method of claim 3, wherein the nucleic acid is attached to a surface.

7. (Original) The method of claim 6, further comprising ligating adjacent coded probes that are hybridized to the nucleic acid.

8. (Original) The method of claim 7, further comprising separating ligated coded probes from the nucleic acid and non-ligated coded probes.

9. (Canceled)

10. (Original) The method of claim 1, wherein the coded probes are identified by scanning probe microscopy.

11. (Currently amended) The method of claim 1, wherein the coded probes are identified by ~~a process~~ an equipment selected from the group consisting of atomic force microscopy, scanning tunneling microscopy, lateral force microscopy, chemical force microscopy, force modulation imaging, magnetic force microscopy, high frequency magnetic force microscopy, magnetoresistive sensitivity mapping, electric force microscopy, scanning capacitance microscopy, scanning

spreading resistance microscopy, tunneling atomic force microscopy and conductive atomic force microscopy.

12. (Currently Amended) The method of claim ~~9~~ 1, wherein the coded probes aligned on the surface are identified by scanning probe microscopy.

13. (Previously Presented) The method of claim 12, further comprising determining sequences of oligonucleotides that bind to the nucleic acid.

14. (Previously Presented) The method of claim 13, further comprising determining a sequence of the nucleic acid from the sequences of oligonucleotides that bind to the nucleic acid.

15. (Original) The method of claim 3, further comprising identifying the nucleic acid from the coded probes that bind to the nucleic acid.

16. (Original) The method of claim 1, wherein the target molecule is a protein, a peptide, a glycoprotein, a lipoprotein, a nucleic acid, a polynucleotide, an oligonucleotide, a lipid, a glycolipid or a polysaccharide.

17. (Original) The method of claim 16, wherein two or more target molecules are present in a sample and all target molecules in the sample are analyzed at the same time.

18. (Original) The method of claim 16, wherein two or more target molecules are present in a sample and all target molecules of the same type are analyzed at the same time.

19. (Currently amended) A method comprising:

a) obtaining a plurality of coded probes, each coded probe comprising a probe molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two or more identifiably different nano-barcodes that create different signatures;

b) contacting one or more target molecules with the coded probes, and wherein one or more coded probes bind to the target molecules;

c) aligning ~~on a surface~~ the coded probes that bind to the one or more target molecules on a surface by microfluidic molecular combing;

d) using scanning probe microscopy to identify the aligned coded probes; and

e) detecting the one or more target molecules from the identified coded probes.

20. (Canceled)

21. (Previously Presented) The method of claim 19, wherein the scanning probe microscopy is selected from the group consisting of atomic force microscopy, scanning tunneling microscopy, lateral force microscopy, chemical force microscopy, magnetic force microscopy, high frequency magnetic force microscopy, electric force microscopy, scanning capacitance microscopy, scanning spreading resistance microscopy, tunneling atomic force microscopy and conductive atomic force microscopy.

22. (Original) The method of claim 19, wherein the target molecule is a nucleic acid.

23. (Original) The method of claim 22, further comprising determining at least part of the sequence of the nucleic acid from the bound coded probes.

24. (Currently amended) The method of claim 19, further comprising separating the bound coded probes from the target molecules ~~before~~ after the coded probes are aligned on a surface.

25-28. (Canceled)

29. (New) The method of claim 1, wherein the coded probes are further aligned on the substrate surface by electrophoresis.

30. (New) The method of claim 19, wherein the coded probes are further aligned on the substrate surface by electrophoresis.

31. (New) A method comprising:

a) obtaining a plurality of coded probes, each coded probe comprising a probe molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two or more identifiably different nano-barcodes that create different signatures;

b) contacting one or more target molecules with the coded probes;

c) aligning the coded probes that bind to the one or more target molecules on a surface by electrophoresis;

d) identifying the organized coded probes; and

e) detecting the one or more target molecules based on the bound coded probes.

32. (New) A method comprising:

a) obtaining a plurality of coded probes, each coded probe comprising a probe molecule attached to at least one nano-barcode, and at least two of the coded probes comprise two or more identifiably different nano-barcodes that create different signatures;

b) contacting one or more target molecules with the coded probes, and wherein one or more coded probes bind to the target molecules;

c) aligning the coded probes that bind to the one or more target molecules on a surface by electrophoresis;

d) using scanning probe microscopy to identify the aligned coded probes; and

e) detecting the one or more target molecules from the identified coded probes.